Engaging nursing students in a bioscience unit using a web-based response system, GoSoapBox

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Abstract

Nursing students used GoSoapBox, a web-based student response system to poll responses to multiple choice questions (MCQs) presented during bioscience lectures. Participation in GoSoapBox appears to have facilitated student engagement, interaction and learning. The majority of students surveyed appreciated the immediate feedback to the student responses and being able to participate anonymously. The use of this tool facilitated collaborative group and class discussion and clarification around any misconceptions or challenging concepts. Information collected using GoSoapBox provided the academic with feedback allowing for reflection, adjustment and improvement in framing of formative and summative MCQs.

Introduction

Although student engagement may be viewed more broadly as an integration of behavioural and psychological processes within a sociocultural context, it generally focuses on student behaviour and teaching practice (Kahu, 2013). The Australian Council for Educational Research (ACER) (2014) associates student engagement with enhanced learning outcomes and student satisfaction and identifies active learning as one of the indicators of student participation and involvement in learning activities.

Maintaining active student engagement of large student cohorts in teacher-centred lectures is very challenging (O'Donoghue, Jardine & Rubner, 2010). Additionally it is difficult to determine whether students have comprehended lecture content and frequently misconceptions are only identified during assessment at the end of a course (O'Donoghue et al., 2010). In response many universities in Australia are incorporating student-centred technologies, such as classroom response systems, into teaching practices to enhance the student learning experience. Classroom response systems enable students to participate in lectures and provide instant feedback to teacher questions.

The benefits of classroom response systems in education, including nurse education, encompass the creation of an interactive and engaging classroom environment, promoting active learning, improving student satisfaction, increasing academic awareness of student understanding by providing immediate formative assessment and enabling anonymous participation in classroom discussion (Fies & Marshall, 2006; Zumehly & Leadingham, 2008; De Gagne, 2010). Research highlights the importance of interactions or discussions between the lecturer and students and also between peers (ACER, 2010). Such interactions are recognised as important strategies in promoting higher order thinking and deepening student understanding of concepts. Additionally the teaching academic can modify teaching strategies or content, based on feedback data collected using this response tool (Fies & Marshall, 2006; Zumehly & Leadingham, 2008; De Gagne, 2010).

GoSoapBox (http://www.gosoapbox.com/) (Figure 1.) is a flexible, web-based response system that enables students to use their mobile devices including a phone, tablet or laptop computer, to actively participate in lectures. There is little literature relating to the use of GoSoapBox, but Schultz (2013) reported that the use of this e-tool in a first year chemistry class of over 300 students received mainly positive student responses.

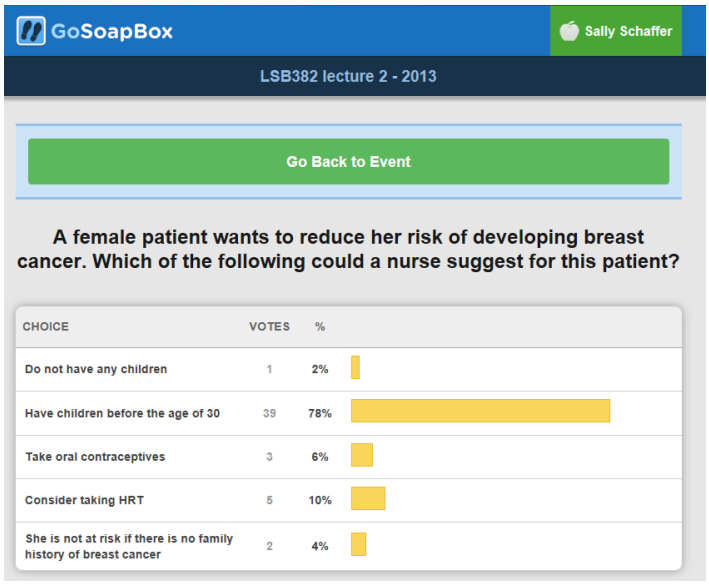

Figure 1. GoSoapBox polling used during lectures.

Since the transfer of nursing education into the higher education arena in the 1970s it has been noted that the bioscience subjects, mainly anatomy, physiology, microbiology and pathophysiology, cause great difficulty for nursing students (McVicar, Clancy & Mayes, 2010). Anecdotal evidence of high failure rates amongst nursing students at QUT in the 2000s suggest these students also struggle with the biosciences.

In semester 1, 2013 a trial was undertaken to actively engage nursing students in learning in a bioscience unit using the web-based response system, GoSoapBox. Student-centred objectives were twofold: to increase the participation of students via GoSoapBox and in collaborative discussions during lectures; and to provide immediate clarification and feedback to formative multiple choice questions (MCQs) answered during lectures.

The second aim was to assist the academic in identifying and understanding misconceptions in students' understanding of the framing of MCQs or the concepts being tested. This enabled the academic to reflect on problematic questions making adjustments to improve the clarity of formative and summative MCQs and future lecture material.

Methods

Although the number of student enrolments in this unit was about 500, the attendance at lectures was approximately 60-70%, whilst at the mid-semester exam feedback session attendance was less than 30%.

GoSoapBox polling was used during two lectures and a mid-semester exam feedback session. At the start of the sessions, students were invited to use their mobile device to connect to http://app.gosoapbox.com and to join a GoSoapBox event using the access code provided; this enabled them to "poll" the answers MCQs presented during the session. Event settings ensured that student participation was anonymous. If a student had no access to a mobile device or chose not to join the event, they were still able to participate in answering the MCQs by marking their response on their lecture notes or participating in collaborative group discussions. The use of the tool was entirely voluntary. The lectures were recorded allowing students to review the MCQs and feedback although they were not able to participate in the polling.

During the lectures four MCQs were presented on powerpoint. Students were asked to discuss the options with their peers before polling their responses. Responses to MCQs could be polled either individually or as a collaborative group response. During the mid-semester exam feedback session, polling was used to assess student responses to nine poorly answered MCQs (where less than 45% of students gave the correct answer) from the exam. During all sessions, the percentage polled student responses were visible on their mobile devices and on the screen as a histogram. The results of the polls were discussed as a class i.e. why one response was correct and why the others were incorrect. The academic called for feedback from the students if a question was poorly answered. Data regarding the individual student responses for each MCQ was collated in Excel by GoSoapBox and emailed to the academic; the percentage of correct responses for each MCQ was then calculated.

A survey of student responses was conducted during an end-of-semester lecture, to obtain an indication of student opinions regarding the use of GoSoapBox polling (Figure 1). Students were asked to respond to statements about the use of polling in face-to-face sessions, using a 5 point Likert scale (from strongly agree to strongly disagree). Additionally they could comment on what they liked most or least about the use of this e-tool in this unit. Two hundred and forty one students responded to the survey with 43% of respondents identifying that they had participated in the GoSoapBox polling.

Results

The number of polling responses (individual or collaborative) in the first lecture averaged 56 per question and this declined to 34 for the second lecture and 22 for the mid semester exam feedback session.

Of the total of 19 MCQs polled in these sessions, 11 questions had over 80% correct response rate. Two had a correct response rate of less than 36%; in one of these MCQs the students commented that the wording of the question was ambiguous, and in the other the students commented that they *"found the topic of chronic renal failure to be difficult."*

Participant response to the tool was highly positive with about 80% of students that participated in the survey agreed or strongly agreed with the recommendation that the academic use GoSoapBox polling again. Of those respondents that did not participate in polling, only a very small percentage thought it was a waste of time; the remaining students had no digital device, did not know how to participate or were not interested in polling.

The majority of respondents noted that participation in the polls made the bioscience lectures more engaging (the exercise helped them to pay attention, allowed for good interaction or made the lecture more interesting or easier to understand) (Figure 2.). Eighty two percent felt it made

them think more carefully about their answers to MCQs during the session. About 70% said that it made them realise that other students shared the same difficulties with understanding as them. About 30% of respondents thought that it took unnecessary time away from lecture content and 20% did not like the technical issues associated with its use.

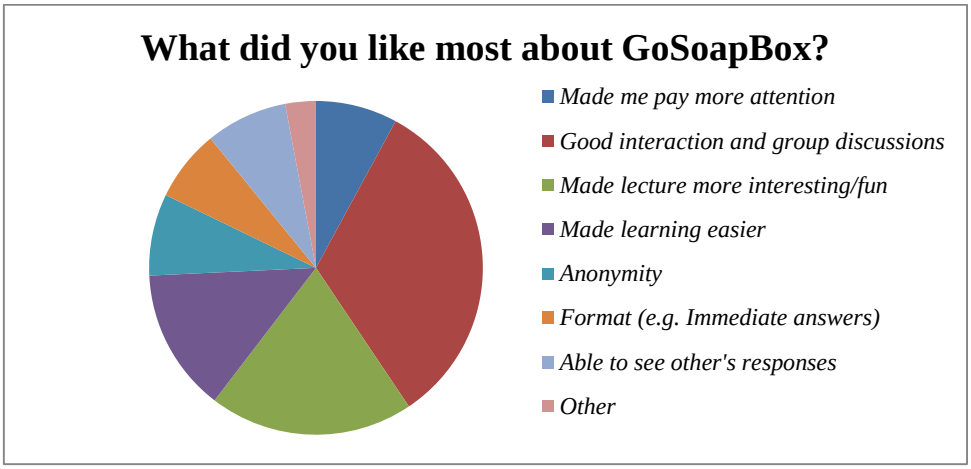

Figure 2. What students liked most about GoSoapBox.

Student feedback regarding the use of GoSoapBox polling included the following positive comments:

The lecturer can see how students are understanding and adapt to their understanding
It is a fantastic idea and I believe it definitely assisted and improved my learning
Interactive answers get explained better when large group gets answers wrong
Testing us during lectures, keeps us awake, entertaining

Negative student comments included:

Sometimes we spent too long on them and I felt ready to move on
It may have been more trouble than it was worth. Most people didn't use it.
It was a good idea but my phone service was poor

Discussion

The use of this web-based response system aimed to provide the academic with a mechanism to address some of the content challenges in biosciences by facilitating engagement and interaction during the lectures. In addition, the tool provided an opportunity for collaborative group and class discussion and clarification around any misconceptions or challenging concepts. Students reported that they appreciated the immediate feedback to their responses, seeing other student responses and being able to participate anonymously. They also stated that they gave more considered responses to the questions posed.

Although participation rates in polling were good, they declined in time, possibly due to decreasing class attendance. There were issues of equity as some students did not have a mobile device in the lectures or experienced technical problems such as the device not supporting the "app", nevertheless all students were encouraged to participate actively and collaboratively in group or class discussion.

In their review of the literature Fies and Marshall (2006) noted that the use of classroom response systems can promote learning when used with appropriate teaching practices. The use

of GoSoapBox together with peer to peer discussions, serves as a valuable strategy to promote active learning and engagement.
The information collected using GoSoapBox provided timely feedback which allowed for reflection, adjustment and improvement of formative MCQs or lecture material in order to enhance student learning experiences. Upon revelation of the polling results, as it appeared that students were struggling with a particular concept e.g. chronic renal failure, the academic revisited the concept immediately and changes were subsequently made to clarify the concept in lecture material for future classes. Where the students noted ambiguous wording to an MCQ, that question was changed for use with future classes or end-of-semester exams.

In conclusion GoSoapBox polling will be used occasionally in this unit due to technology issues, but to facilitate engagement by offering students the opportunity to actively collaborate and participate in lectures and provide feedback to the academic regarding their learning which will allow for improvement in framing of formative and summative MCQs.

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